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Abstract

Forms of differentially acting glycoprotein hormones are disclosed. These compositions are of the formula

- 5         $\beta^1\text{-(linker}^1\text{)}_m\text{-}\alpha\text{-(linker}^2\text{)}_n\text{-}\beta^2$                     (1);  
          $\beta^1\text{-(linker}^1\text{)}_m\text{-}\beta^2\text{-(linker}^2\text{)}_n\text{-}\alpha$                     (2);  
          $\alpha\text{-(linker}^1\text{)}_m\text{-}\beta^1\text{-(linker}^2\text{)}_n\text{-}\beta^2$                     (3);  
          $\beta^2 \approx \alpha\text{-(linker)}_m\text{-}\beta^1$                                 (4); or  
          $\beta^1\text{-(linker)}_m\text{-}\alpha \approx \beta^2$                                 (5)

- 10        wherein each of  $\beta^1$  and  $\beta^2$  has the amino acid sequence of the  $\beta$  subunit of a vertebrate glycoprotein hormone or a variant of said amino acid sequence, as variants are defined herein. " $\alpha$ " designates the  $\alpha$  subunit of a vertebrate glycoprotein hormone or a variant thereof; "linker" refers to a covalently linked moiety that spaces the  $\beta^1$  and  $\beta^2$  subunits at appropriate distances from the  $\alpha$  subunit and from each other. " $\approx$ " is a  
15        noncovalent link. Each of m and n is independently 0 or 1.

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